DBDM: “Registration”

Please send an email

To: s.manegold@liacs.leidenuniv.nl
Subject: [DBDM-2018] Registration

containing the following information:

- Your full name
- Your email address
- Your student ID
- Your affiliation (university)
- Your program / subject

By Sunday 16 September 2018, 23:59 CEST.

DBDM: Overview

Period: September 11th - December 4th 2018 (Tuesdays)
Place: Room 312 (LIACS, Snellius building, Niels Bohrweg 1, 2333 CA Leiden)
Time: 15.30 - 17.15
ECTS: 6

Description:
The course Databases & Data Mining consists of a series of lectures in which advanced database and data mining techniques will be discussed, with applications to bioinformatics.

Grading:
There will be 2 database and 2 data mining assignments, i.e., 4 assignments in total, and a final exam (open book). The final grade will be based on a weighted average of the grades obtained for assignments P1, P2, P3, P4 and the Exam (E >5):
Final Grade = (0.5*P1 + P2 + 0.5*P3 + P4 + 3*E)/6.

DBDM: (tentative) Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Room</th>
<th>Subject (tentative)</th>
<th>Topic &amp; Lecturer</th>
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<tr>
<td>11-09</td>
<td>312</td>
<td>Introduction</td>
<td>Databases and Data Management for Data Mining</td>
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<tr>
<td>18-09</td>
<td>312</td>
<td>Database Technology</td>
<td>Stefan Manegold</td>
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<tr>
<td>25-09</td>
<td>312</td>
<td>Database Technology</td>
<td>Databases and Data Management for Data Mining</td>
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<td>02-10</td>
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<td>Data Preprocessing</td>
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<td>09-10</td>
<td>312</td>
<td>No class</td>
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<td>16-10</td>
<td>312</td>
<td>Data Warehousing and OLAP</td>
<td>Erwin Bakker</td>
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<td>23-10</td>
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<td>Data Cube Technology</td>
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<td>30-10</td>
<td>312</td>
<td>Basic Data Mining Algorithms I</td>
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<td>06-11</td>
<td>312</td>
<td>Basic Data Mining Algorithms II</td>
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<td>Advanced Data Mining Algorithms</td>
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<td>Mining in Bio-Data</td>
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<td>27-11</td>
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<td>Graph Mining I</td>
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<tr>
<td>04-12</td>
<td>312</td>
<td>Graph Mining II</td>
<td>Erwin Bakker</td>
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https://homepages.cwi.nl/~manegold/DBDM/
http://liacs.leidenuniv.nl/~bakkerem2/dbdm/
DBDM: Assignments

- 2 database assignments & 2 data mining assignments
- Will be announced individually during lectures and posted on website

DBDM: Exam

- **open book exam**: you can take with you your book, and printed course notes (slides). No electronic equipment is allowed, though.

- **Materials to be studied**:
  - All content covered and discussed during lectures (slides will be shared).
  - More to be announced.

- **Date**: Monday, January 7, 2019
- **Time**: 14:00 - 17:00
- **Place**: Room F104, Van Steenisgebouw, Einsteinweg 2, 2333 CC Leiden

DBDM: Recommended Books

- **Data Mining**:

- **Database systems (e.g.)**:

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The age of Big Data

1500TB/min = 1000 full drives per minute
= a stack of 20 meter high

4000 million TeraBytes = 3 billion full disk drives
The Data Economy

Disruptions by the Data Economy

DBDM: Selected Challenges

GIS (LIDAR):
Massive point clouds: 640 Billion (x,y,z) points / 15 TB
=> spatial joins between point cloud and polygons

Logistics:
> 5 trillion \((10^{12})\) GPS points (grows with >60k points/sec)

Seismology:
~ 4 M files, ~ 500 GB (10x compressed)
=> Transparent data ingestion: Data Vault

Remote sensing:
~2 PB satellite image data
=> Array data processing: SciQL

Astronomy:
Raw data: 25 TB / hour; derived data: 100 TB / year
=> Transient detection inside DBMS
Data Disrupting Science: Paradigm Shift in Scientific Research

- Observing
- Empirical
- Theoretical
- Modeling
- Computational
- Simulating
- Collecting & Analyzing Data
- Data Exploration (eScience)

Jim Gray (1944 - 2007)

Data Management & Data Mining

Low Frequency Array for Radio Astronomy

Raw data: ~25 TB / hour
Derived data: ~100 TB / year

Earth Observation: DLR Satellite Data Acquisition (in TeraByte)

~2000 TB

Data Driven Science
- Raw data: ~25 TB / hour
- Derived data: ~100 TB / year

LOFAR telescope

DBDM: Earth Observation